

Montana Weather/Precipitation Summary

March 2015 by NOAA's National Weather Service Great Falls Montana

The first few days of March were on the cool side, followed by a long period of generally above normal temperatures. Many new record high temperatures were established. Upper level flow patterns have not changed much over the past three months. There has been a persistent ridge of high pressure along the North American West Coast, while a trough was over the eastern portion of North America. This anomalously strong ridge (Fig. 1) brought above normal temperatures, and generally dry conditions to most of the state. Only the northeast and northwest saw above normal precipitation.

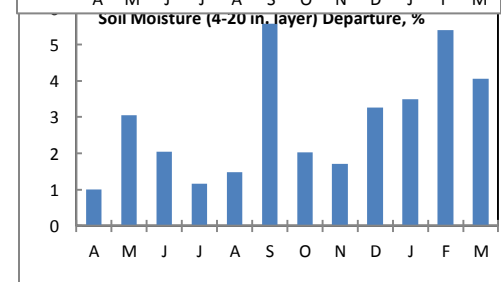
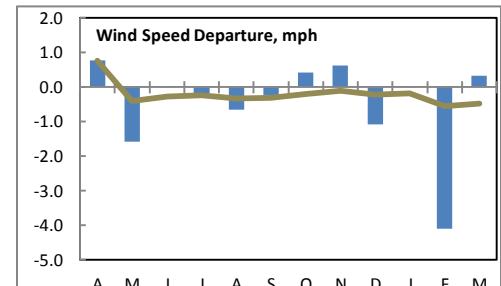
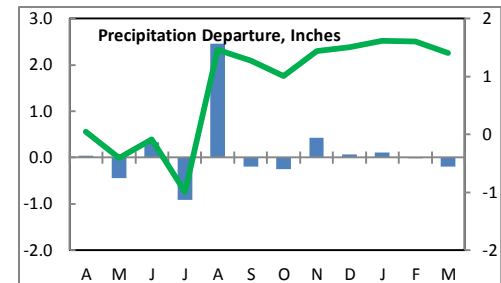
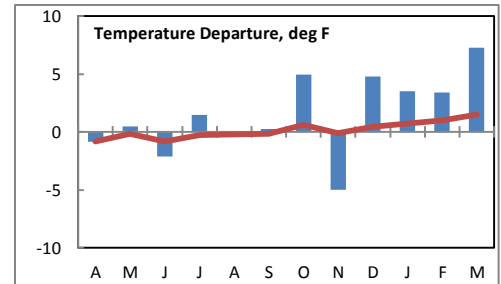
Statewide composite temperatures averaged 7.3°F above normal for the month. The temperature anomalies ranged from +1.9°F at West Yellowstone to +9.5°F at Lewistown (Fig. 2). The warmest average monthly temperature was 46.6°F at Flat Willow, and the coolest was 25.1°F at Flattop Mountain. This was the second warmest March of record, and the warmest since 1910. For the past 12-months, the statewide composite average temperature is 1.5°F above normal. The past four months have had warm departures of 3F or more and 8 of the last 12 months have had warmer than normal temperatures. The temperature range of 108°F for March (85 to -23) was the greatest since 2009.

The monthly departure from normal for precipitation across Montana is shown in Figure 3. Above normal precipitation was limited to the northwest and northeast. Much of the state recorded below normal values. The highest amount was 11.20-inches at Poorman Creek (Lincoln County) and 7.00-inches at Many Glacier. Statewide, this month averaged 0.71-inches, or 0.20-inches below normal. The statewide composite precipitation for the past 12 months is 1.41-inches above normal. Snowfall was below normal. The statewide average was 1.8-inches, or 7.1-inches below normal. The heaviest amount was 14.0-inches near Red Lodge. Statewide seasonal (Oct-Mar) snowfall averages are running 6.2 inches below normal.

The statewide average winds were slightly above normal this month, ranking as the 38th windiest March of record. The statewide composite average was 9.9 mph, 0.3 mph above normal. The 12-month average is running 0.5-mph below average. The fastest average speed was 24.5 mph at Deep Creek RAWS, while Livingston recorded an average of 17.5-mph. The fastest measured gust of the month, 81 mph, occurred near Stanford on the 28th.

After a relatively wet calendar year of 2014 (10th wettest of record), the soil moisture conditions remain favorable across the state. There are dryer areas, but overall, the statewide soil moisture average is 4.1 points higher than the average (1997-2014), and the second wettest for March. The wettest year was in 2007.

Refer to NCDC's State of the Climate report for the latest monthly discussion:
<http://www.ncdc.noaa.gov/sotc/>.



Mar 1-5

March started with cooler than normal conditions. A storm system brought snow to much of western and southern Montana. Red Lodge picked up 14 inches of snow on the second, while Ninemile and Churchill both measured 5 inches. Gusty west winds began along the Rocky Mountain Front on the 4th, with gusts reaching 69 mph at Deep Creek RAWS. Whisky Creek dropped to -23°F on the 4th, which was the coolest temperature of the month.

Mar 6-31

Other than a couple of brief periods of cooler temperatures, much of the rest of the month was warmer than normal. Many record high temperatures were set during this period. A cooler period around the 16th and 17th brought some heavy precipitation (mostly rain) to western Montana. Nearly six inches of precipitation fell at Poorman Creek (Lincoln County) and 4.5 inches to Flattop Mountain. Many Glacier picked up six inches of snow. The other cooler period was the 23rd -25th. Some pea-size hail was reported near Montana City on the 23rd, and on the 24th and 25th, five inches of snow in northeast Montana at Brockton and six inches of snow at Billings and a foot in the mountains of south central Montana. Record high temperatures were set at various locations again on the 27th, 28th and 31st. A cold front was accompanied by very strong winds on the 28th. Billings tied their all-time highest temperature for March on the 28th, reaching 80°F. Gusts over 70 mph were reported across much of the state. Blowing dust reduced visibility in southwest, central and northeast Montana.

Record high temperatures, dates and locations in March

Date	City	Record High
Mar 9	Havre	68°F
Mar 10	Kalispell	63°F
Mar 13	Cut Bank	66°F
Mar 14	Billings	71°F
	Bozeman	69°F
	Butte	63°F
	Glasgow	75°F
	Great Falls	71°F
	Havre	74°F
	Helena	72°F
	Miles City	75°F
Mar 15	Billings	75°F
	Dillon	63°F
Mar 20	Bozeman	67°F
	Dillon	67°F
Mar 21	Bozeman	66°F
Mar 27	Billings	77°F
	Bozeman	74°F
	Butte	68°F
	Dillon	74°F
	Great Falls	74°F
	Havre	75°F
	Helena	76°F
	Lewistown	73°F
	Livingston	74°F
	Missoula	74°F
Mar 28	Billings	80°F
	Lewistown	72°F
	Miles City	83°F
Mar 31	Bozeman	74°F
	Butte	66°F
	Dillon	73°F
	Great Falls	76°F
	Havre	78°F
	Helena	75°F
	Lewistown	75°F

Precipitation/convection

Severe convective weather occurred on zero days in March. This is normal for the month. Non-severe thunderstorms were observed on the 23rd and 28th.

October through March

The water-year-to-date average temperature was above normal. The average of 31.9°F is the 7th warmest of record, and the warmest since 2011-2012. Precipitation averaged 4.99", and the 64th driest of record. This is close to the mean, 0.15" above normal. Seasonal snowfall of 26.2" is the 61st lowest of record, again near the middle. Winds averaged 8.7 mph, or the 6th calmest of record. This is the calmest such period since 2009-10.

February summary information:

High Temperature	85°F at Mizpah (28 th)	Greatest Precip	7.00" at Many Glacier
Low Temperature	-23°F at Whiskey Creek (4 th)		11.20" at Poorman Creek SNOTEL (Lincoln)
Warmest Ave Temp	46.6°F at Flat Willow	Peak Wind Gust	81 mph near Stanford (28 th)
Coolest Ave Temp	25.1°F at Flattop Mtn		
Range of Temp departures	+1.9°F at West Yellowstone to +9.5°F at Lewistown	Highest Ave Wind	17.5 mph at Livingston 24.5 mph at Deep Creek
21 city mean monthly Temperature/Normal	40.4/33.2F 7.3F above normal. 2 nd warmest of record (since 1880). 97 th percentile. Oct-Mar 31.9/28.8 3.1F above normal. 7 th warmest of record.	20 city mean monthly wind speed/Normal	9.9 mph/9.6 mph; 38 th windiest of record (since 1936). 51 st percentile. Oct-Mar 9.1 mph/9.8 0.7-mph below normal. 22 nd calmest of record.
22 city mean monthly precipitation/Normal	0.71/0.91" – 78% of normal. 40 th driest of record (since 1880). 30 th percentile. Oct-Mar 5.14"/ 4.99" – 0.15" above normal. 64 th driest of record.		

Historical Rank of Precipitation (inches) for the Current Month and Water Year to Date

Location	Mar	% of Norm	Rank	Pcntl	Oct 1 – Mar 31	% of norm	Rank	Pcntl	Years
Baker	0.55	88%			2.44	79%			17
Billings	0.37	33%	26	22	3.24	62%	36	31	114
Belgrade	0.47	50%	9	10	2.77	65%	7	8	78
Butte	0.41	54%	24	19	3.10	87%	44	36	121
Cut Bank	0.42	84%	60	55	3.84	201%	101	93	108
Dillon	0.15	28%	6	7	1.50	63%	12	15	75
Glasgow	0.75	179%	92	78	3.07	118%	76	65	116
Great Falls	0.09	10%	2	1	4.44	114%	64	52	123
Havre	0.53	98%	77	56	3.73	146%	88	65	135
Helena	0.15	25%	12	8	3.45	122%	55	40	137
Jordan	0.53	102%			2.92	114%			17
Kalispell	1.66	152%	110	90	11.27	153%	118	98	121
Lewistown	0.27	27%	7	5	4.08	91%	35	29	119
Livingston	0.27	32%	13	11	3.40	81%	27	23	112
Miles City	0.10	17%	9	6	1.46	53%	6	4	138
Missoula	0.49	51%	34	24	8.02	146%	116	86	135
Mullan Pass	5.83	130%	64	89	29.81	116%	49	66	74
Wolf Point	0.67	146%			1.54	62%			17
Glendive	0.59	98%	60	50	3.12	98%	59	50	116
Sidney	0.39	65%	38	49	2.58	74%	29	38	75
BZN-MSU	0.61	44%	11	7	6.09	89%	60	44	136

Rankings and Percentiles are 1=driest, higher numbers=wetter.

For an automated version of this chart, updated daily, go to

<http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>

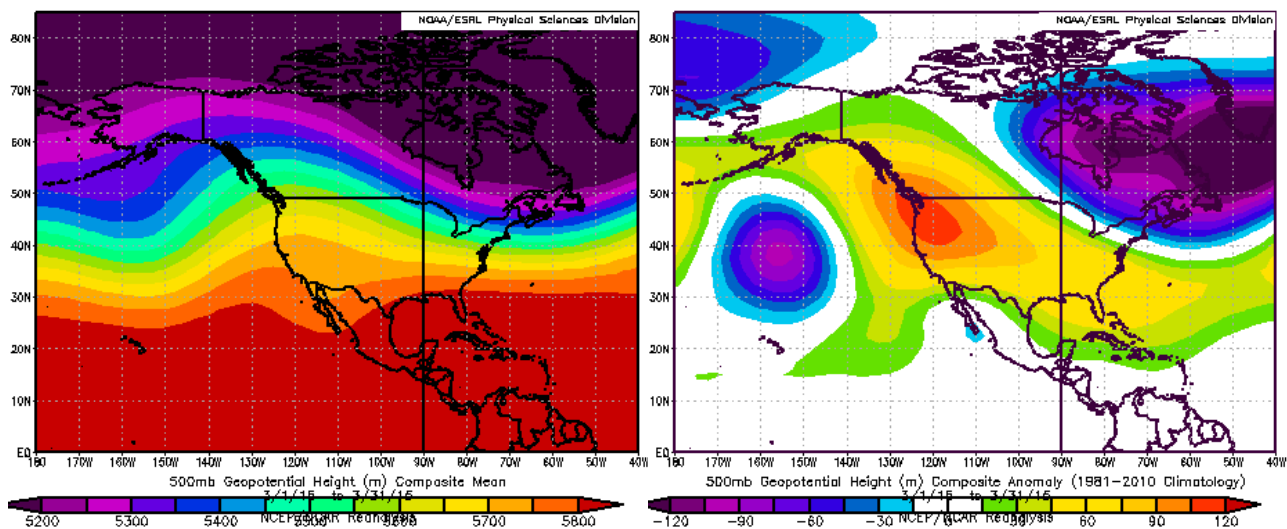


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (top-left) and departure from normal (top-right).

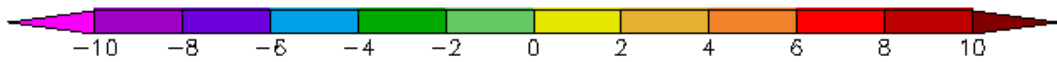
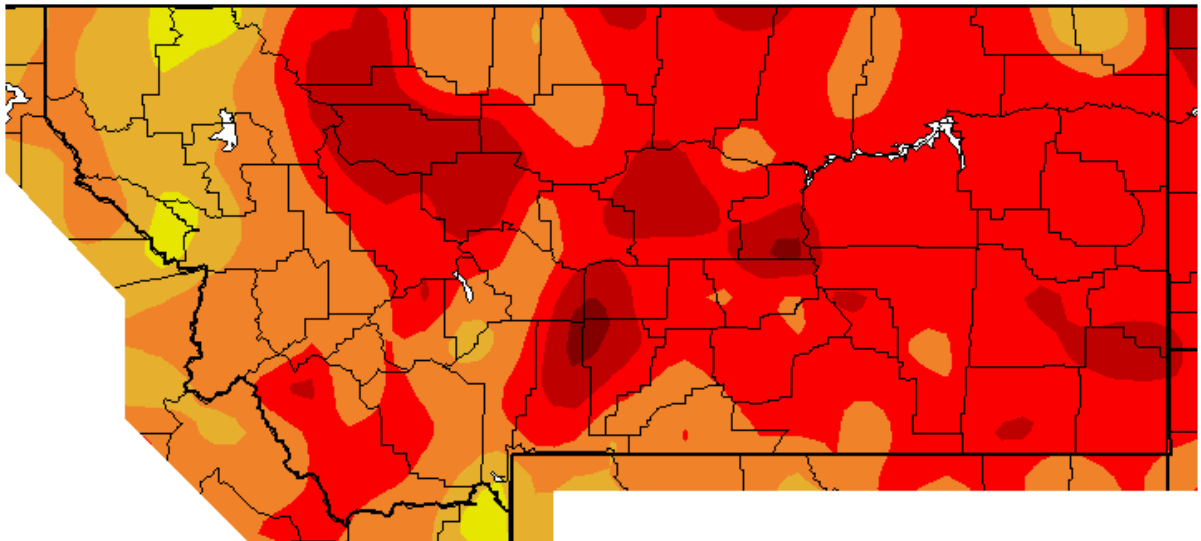


Figure 2. March 2015 temperature departures from normal (°F) (Western Region Climate Center).

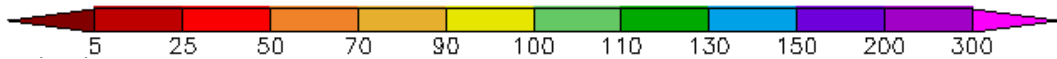
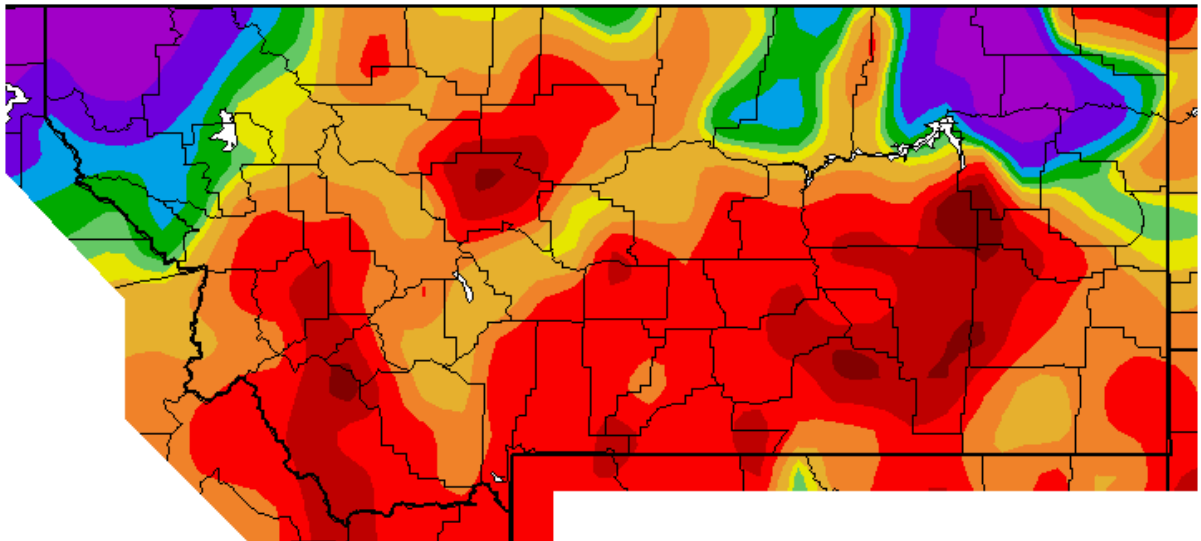


Figure 3. March 2015 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to:
<http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=txf>

For the latest information on mountain snowpack from the NRCS, go to: <http://www3.wcc.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to:
<http://droughtmonitor.unl.edu/>

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be accessed at the National Climatic Data Center (NCDC) <http://www.ncdc.noaa.gov>. Many more links are on the Drought Information Page of the NWS Great Falls web site at <http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=txf>. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.